

REMARKS

Claims 1-19 were examined in the Final Office Action dated August 21, 2007.

Claims 1, 3-15, and 17-19 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,232,706 to Dai *et al.* (Dai) in view of U.S. Patent Application Publication 2002/0036452 to Muroyama *et al.* (Muroyama).

Claim 2 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Dai and in view of Muroyama and U.S. Patent No. 5,863,601 to Kikuchi *et al.* (Kikuchi).

Claim 16 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Dai and in view of Muroyam and U.S. Patent No. 4,650,895 to Kadokura *et al.* (Kadokura).

Addressing the Examiner's Rejections

Rejections of the Claims Under 35 U.S.C. §103(a)

(a) The Examiner maintained the rejection of claims 1, 3-15, and 17-19 under 35 U.S.C. §103(a) as allegedly being unpatentable over Dai in view of Muroyama. In maintaining the rejection, the Examiner states:

Muroyama provides motivation for modifying the metal oxide catalyst of Dai to the metalorganic catalyst of Muroyama to improve the nanostructures' selective growth properties (Muroyama paragap 0050). If anything, if Muroyama teaches that having oxide is undesirable as use for a catalyst, it furthers the point that the catalyst of Muroyama improves upon that of Dai. It is also noted that removing oxide in Muroyama occurs in some embodiments and not others, so it does not follow that the reference of Muroyama teaches away from Dai.

The applicant traverses the rejection and the reasoning of the Examiner. The Examiner states that only some embodiments of Muroyama remove the oxide and not the others. However,

this statement is contradicted by Muroyama. Muroyama at paragraph 95 states: “In the production method according to the first, second or third aspect of the present invention (these production methods will be sometimes generally referred to as “the method of the present invention” hereinafter),...” Muroyama thus clearly states that all three embodiments of the invention were being discussed in paragraph 95. Then, further in paragraph 95, Muroyama states that “it is preferred to remove a metal oxide (so-called natural oxide film) on the surface of each metal particle or on the surface of the metal thin layer or the organometallic compound thin layer.” Thus, Muroyama teaches removing the metal oxide in all embodiments of their invention.

Muroyama, in paragraph 95, states that the reason for removing the metal oxide is to provide for more reliable growth of the carbon film.

...for making more reliable the selective growth of the carbon film on the carbon film selective-growth region, after the metal particles are allowed to adhere onto, or the metal thin layer or the organometallic compound thin layer is formed on, the surface of the cathode electrode, it is preferred to remove a metal oxide (so-called natural oxide film) on the surface of each metal particle or on the surface of the metal thin layer or the organometallic compound thin layer.

Thus, the desire to selectively grow carbon film more reliably would motivate one of skill in the art to remove the metal oxide.

Further, the applicants are claiming depositing a metalorganic layer on the substrate and oxidizing the portion of the metalorganic layer deposited on an unmasked portion of the substrate to form a growth catalyst on the substrate. Muroyama discloses the use of a metalorganic layer in Examples 11 and 12, where the metalorganic is nickel acetylacetonate. In both examples where a metalorganic layer is used by Muroyama, the metal oxide is

removed. Thus, at paragraphs 268 and 276, Muroyama states “after the organometallic compound thin layer is formed, the metal oxide (natural oxide film) on the surface of the organometallic compound thin layer may be also removed in the same manner as in [Step-720] in Example 7.” Thus, the Muroyama embodiment that is closest to the applicants’ claimed invention, the Examples show that the metal oxide is removed.

Thus, Dai and Muroyama, alone or in combination, do not disclose oxidizing the metalorganic layer to form a growth catalyst. Dai only discloses depositing an iron layer on a substrate and oxidizing the iron layer to form a growth catalyst. Dai does not disclose substituting iron layer with a metalorganic layer. Muroyama discloses removing the metal oxide. In particular, the two examples where Muroyama uses the organometallic compound to form the growth catalyst, the corresponding oxide is removed prior to growth of the carbon film which is said to provide for more reliable growth of the carbon film. Thus, while Muroyama teaches the use of certain organometallic compounds as catalysts, it teaches away from oxidizing the organometallic layer to form a growth catalyst on the substrate. Thus, one of skill in the art would not combine Dai with Muroyama. The Examiner is therefore respectfully requested to withdraw the rejection.

(b) The Examiner rejected claim 2 under 35 U.S.C. §103(a) as allegedly being unpatentable over Dai in view of Muroyama and Kikuchi. The applicants traverse the rejection. Claim 2 depends from claim 1 and thus contains all the elements of claim 1. The combination of Dai, Muroyama and Kikuchi does not disclose depositing a metalorganic layer on the substrate and oxidizing the portion of the metalorganic layer deposited on an unmasked portion of the substrate to form a growth catalyst on the substrate. Muroyama in fact discloses removing the

oxide that may form when a metalorganic is used as a catalyst. The Examiner is respectfully requested to withdraw the rejection.

(c) The Examiner rejected claim 16 under 35 U.S.C. §103(a) as allegedly being unpatentable over Dai in view of Muroyama and Kadokura. The applicants traverse the rejection. Claim 16 depends from claim 1 and thus contains all the elements of claim 1. The combination of Dai, Muroyama and Kadokura does not disclose depositing a metalorganic layer on the substrate and oxidizing the portion of the metalorganic layer deposited on an unmasked portion of the substrate to form a growth catalyst on the substrate. Muroyama instead teaches removing the oxide that may form when using metalorganic as a catalyst. The Examiner is respectfully requested to withdraw the rejection.

CONCLUSION

The claims pertain to patentable subject matter, and a notice of allowance is earnestly solicited. If the Examiner has any questions concerning this Response, the Examiner is invited to telephone Applicants' representative at (650) 335-7818.

Respectfully submitted,
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